Office Action Summary	Application No.	Applicant(s)	
	10/706,081	RAVI, NATHAN	
	Examiner	Art Unit	
	LEZAH W. ROBERTS	1612	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *20 October 2008*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-27,29-39 and 45-121* is/are pending in the application.

4a) Of the above claim(s) *1-22,30,32,33,46-116 and 119-121* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *23-27,29,31,34-39,45,117 and 118* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☒ Interview Summary (PTO-413) Paper No(s)/Mail Date. *20090108* .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Applicants' arguments, filed October 20, 2008, have been fully considered. Rejections and/or objections not reiterated from previous office actions are hereby withdrawn. The following rejections and/or objections are either reiterated or newly applied. They constitute the complete set presently being applied to the instant application.

The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action. This Office Action is made Non-Final.

Claims

Claim Rejections - 35 USC § 103 – Obviousness (New Rejections)

1) Claims 23-29, 31, 34-39 and 117-118 are rejected under 35 U.S.C. 103(a) as being unpatentable over Marchant (US 2002/0068087) in view of Viegas et al. (US 2003/0143274), the combination being taken further in view of Yanni et al. (US 6,242,480).

Marchant discloses hydrogels which are bioadhesive compositions comprising two or more essentially excretable, essentially non-degradable polymer backbones. The polymer backbones are cross-linked, and said cross-link is degradable in a mammal. The hydrogel demonstrates bioadhesion to a mucosal surface that is cross-

linked by a degradable linkage such as disulfide for use inside the body (see Abstract). The compositions act as drug carriers and deliver the drug to areas such as the eyes. The hydrogels are susceptible to reduction and oxidation. The polymer backbone comprises subunits selected from the group consisting of polyacrylic acids, polymethacrylic acids, allyl, allyl amines, acrylic acid esters, amides, pH-sensitive monomers, N-vinyl pyrrolidones, hydroxyethylmethacrylates (HEMA), and combinations thereof (paragraph 0044). Cross-linkers include bis N,N'-acrylamide cystamine, which has been reported as being useful in forming reversible crosslinked gels (paragraph 0066). Any oxidizing agent such as air is capable of making or reestablishing the disulfide bonds (paragraph 0073). Any thiol containing reagents such as dithiothreitol, dithioerythritol, 2 mercaptoethanol and mercaptoethylamine, and cysteine can serve as reducing agents for disulfides (paragraph 0072). The reference differs from the instant claims insofar as it does not disclose the hydrogels are formed *in situ* or injected into the capsular bag of the eye.

Viegas et al. disclose medical uses of *in situ* formed gels. The gels may be used to deliver medicaments to the eye. Polymers of methylmethacrylate and 2-hydroxyethyl methacrylate may be used in the compositions. The compositions of the invention are low viscosity liquids at ambient temperatures; they easily pass to various ophthalmic areas insuring maximum contact between exposed tissue and the composition of the invention, which form gels at the point of treatment (paragraph 0023). If an irreversible gel is required or an elastic gel, that is, one that retains its shape, cross-linking is

required. Cross-linking is the physical, covalent or ionic bonding of two or more molecules of the same polymer (paragraph 0042).

The reference differs from the instant claim insofar as it does not disclose the type of cross-linking agent or that the compositions are reversible although it does disclose the compositions may be absorbed over time.

It would have been obvious to one of ordinary skill in the art to have made the compositions of Marchant *in situ* motivated by the desire to ensure that the compositions easily passed to various ophthalmic areas insuring maximum contact between exposed tissue and the composition as taught by Viegas et al.[1]

The method suggested by the combined teachings of Marchant and Viegas et al. differs from the instant claims, however, insofar as neither reference discloses that the compositions are injected into the capsular bag of the eye.

Yanni et al. disclose ophthalmic viscoelastic compositions that are used to treat conditions such as cataract comprising anti-inflammatory and anti-oxidant activity (see Abstract). Treatment for cataract includes removing cataractous lenses and replacing them with intraocular lenses, which are inserted into the capsular bag. The viscoelastic material is injected into the anterior chamber and capsular bag. The materials comprise pharmaceuticals to treat inflammation caused by cataract surgery (col. 2, lines 25-39). (The tertiary reference differs from the instant claims insofar as it does not disclose the

[1] The Examiner notes that physiological environments have pH values ranging from 6.5 to 7.5. Therefore when the compositions are injected into the body, the limitations of claim 29 are met.

compositions are reversible, comprise a copolymer with a disulfide linker or form a hydrogel.)

It would have been obvious to one of ordinary skill in the art to have administered an anti-inflammatory drug with a liquid composition that forms a hydrogel *in situ* as taught by the combined teachings of Marchant and Viegas, to the capsular bag of the eye motivated by the desire to treat inflammation resulting from cataract surgery as further taught by Yanni et al.

2) Claims 23-27, 29, 31, 34-39, 45, 117 and 118 are rejected under 35 U.S.C. 103(a) as being unpatentable over Talcott (US 4,537,943) in view Marchant (US 2002/0068087), the combination being taken further in view of Klopotek (US 6,730,123).

Talcott discloses compositions for forming *in vivo* a lens in an eye comprising a silicone polymer, a cross-linker and a cross-linking catalyst for injecting into the lens capsule of the eye from which the natural lens has been removed. The synthetic lens composition before placement in the capsular bag is mobile, i.e. of a consistency such that it can be injected into the capsule where it undergoes a physical change due to a curing action which solidifies the composition. The resultant lens is resilient, self-supportable and of a non-pourable consistency so that it conforms to the shape of the lens capsule and holds its shape therein (col. 2, lines 58-67). The composition is curable at body temperature (col. 6, lines 13-23). It may be concluded that the curing process is an oxidation process because the compositions are exposed to oxygen when injected into the eye.

The reference differs from the instant claims insofar as it does not disclose the polymer made is a copolymer with disulfide linkages.

Marchant is discussed above and discloses sulfur comprising cross-linkers. Cross-linkers include bis N,N'-acrylamide cystamine, which has been reported as being useful in forming reversible crosslinked gels (paragraph 0066). Any oxidizing agent such as air is capable of making or reestablishing the disulfide bonds (paragraph 0073). Any thiol containing reagents such as dithiothreitol, dithioerythritol, 2 mercaptoethanol and mercaptoethylamine, and cysteine can serve as reducing agents for disulfides (paragraph 0072). The reference differs from the instant claims insofar as it does not disclose the hydrogels are made *in situ* or injected into the capsular bag of the eye although it does disclose the compositions may be delivered ocularly.

Generally, it is *prima facie* obvious to select a known material for incorporation into a composition, based on its recognized suitability for its intended use. See MPEP 2144.07. It would have been obvious to one of ordinary skill in the art to have used sulfur comprising cross-linkers as the cross-linkers taught by Talcott motivated by the desire to use a cross-linker for its known function and its ability to form cross-linked gels in the presence of air as taught by Marchant.

The disclosures of the primary and secondary references do not, however, provide any particular direction for choosing a cross-linker that makes reversible cross-linked gels. This direction would have been provided, however, by the teachings of the tertiary reference, Klopstock, teaching the benefits of have an adjustable implanted intraocular lens, as discussed infra.

Klopstock discloses adjustable ocular lenses that may be adjusted without the need for invasive procedures (see Abstract). An intraocular lens (IOL) can be implanted into the eye when the natural lens is removed. The implanted lens assists the eye in focusing light onto the retina. IOLs typically provide one or more fixed focusing performances. Typically, the needed refractive correction(s) is (are) determined before implantation of the IOL in the eye. Such pre-operative predictions of the needed corrective power are sometimes not sufficiently accurate. Furthermore, once implanted, an IOL can shift position within the eye, thereby causing a loss of focus. Hence, an individual having an implanted IOL may require additional corrective devices, such as glasses, to acquire the desired visual acuity. The intraocular lens has a focusing performance that can be mortified *in situ*. (The reference differs from the instant claims insofar as it does not disclose the lens is a reversible hydrogel made *in situ* with disulfide links.)

Thus, it would have been obvious to one of ordinary skill in the art to have used cross-linkers such as bis N,N'-acrylamide cystamine that provide reversible cross-links in the compositions of Talcott or to have modified the method of Talcott to use the hydrogel systems of Marchant as lenses, further motivated by the desire to use a compound or composition which has reversible cross-links allowing for the lens to be made into solutions for readjusting without using an invasive procedure when corrective power needs to be adjusted or when an IOL shifts position within the eye, thereby causing a loss of focus, as taught by Klopotek.

Claims 23-27, 29, 31, 34-39, 45, 117 and 118 are rejected.

Claims 1-22, 30, 32, 33, 46-116 and 119-121 are withdrawn.

No claims allowed.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to LEZAH W. ROBERTS whose telephone number is (571)272-1071. The examiner can normally be reached on 8:30 - 5:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Frederick F. Krass can be reached on 571-272-0580. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Lezah W Roberts/
Examiner, Art Unit 1612

/Frederick Krass/
Supervisory Patent Examiner, Art Unit 1612